

Date: Friday, 3/9/2007 10:29:46 AM
 User: Kim Johnston

Process Sheet

Customer	CU-DAR001 Dart Helicopters Services		Drawing Name	X-TUBE 412	
Job Number	31138		Part Number	D412664145	
Estimate Number	12783		Drawing Number	D412-664-245 U/R	<i>OK 07.03.09</i>
P.O. Number	<i>N/A</i>		Project Number	N/A	
This Issue	3/9/2007	S.O. No. <i>N/A</i>	Drawing Revision	U/R	
Prsht Rev.	NC		Material	<i>N/A</i>	
First Issue	<i>N/A</i>		Due Date	4/6/2007	Qty: 1 Um: Each
Previous Run	31137				
Written By					
Checked & Approved By	<i>JL 07.03.09</i>				
Comment	Est Rev:A New Issue 07-02-14 JLM				

Additional Product *

Job Number:



Seq. #:	Machine Or Operation:	Description :			
1.0	DC	DOCUMENT CONTROL			
		Comment: Photocopy bluefile & type labels per PPPD412-664-105	CHG 001	<i>N/A 07.03.16</i>	
2.0	D6019128	Crosstube Material			
		Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)			
		Pick: Qty Part number Description Batch 1 D6019-128 Crosstube <u>29369</u>			
		Check OD = 2.7500", ID = <u>2.130</u>		<i>BC 07-03-12</i>	
3.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE			
		Comment: MORI SEIKI CNC LATHE LARGE			
		Turn as per Dwg D412-664-145		<i>BC 07-03-12</i>	
4.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE			
		Comment: INSPECT PARTS AS THEY COME OFF MACHINE		<i>BC 07-03-12</i>	
5.0	QC8	SECOND CHECK			
		Comment: SECOND CHECK		<i>BC 07-03-12</i>	
6.0	LANDING GEAR 1	LANDING GEAR RESOURCE 1			
		Comment: LANDING GEAR RESOURCE 1			
		1-Polish entire outside surface of crosstube		<i>DP 7-3-13</i>	

W/O:

WORK ORDER CHANGES

DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Friday, 3/9/2007 10:29:46 AM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: X-TUBE_412

Job Number: 31138

Part Number: D412664145

Job Number:



Seq. #: Machine Or Operation:

Description :

7.0 QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

BC 07-03-13

8.0 HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

EL 7-3-13

9.0 QC3/5

INSPECT WORK/WING WALK



Comment: Inspect work & Chemical conversion Coat

7-3-13

10.0 BENDING

BENDING MACHINE



Comment: BENDING MACHINE

Bend tube as per Dwg D412-664-145 using CNC bender program

7-3-13

11.0 QC6

DIMENSIONAL CHECK



Comment: DIMENSIONAL CHECK

M 07/03/13 (i)

12.0 LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill pilot holes in tube as per Dwg D412-664-245

S/D 07-03-14

2-Ream hole to finish size in tube as per Dwg D412-664-245

3-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-245

15D 7-3-15

13.0 HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat Tube as per QSI 005 4.1

Jb 7-3-15

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Friday, 3/9/2007 10:29:46 AM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: X-TUBE 412

Job Number: 31138

Part Number: D412664145

Job Number:



Seq. #: Machine Or Operation:

Description :

14.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

7-3-15

15.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

7-3-15

16.0

OUTSIDE SERVICE

OUTSIDE SERVICES



Comment: Sub-Contracting OUTSIDE SERVICES

C 20703/29

Liquid Penetrant Inspection as per QSI 0380r

~~N/A~~ 7-3-16

Issue P/O: 3440 LPI as per ASTM 1417

Level 2 Attach copy of NDT results to work order

17.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

~~N/A~~ 7-3-16

Inspect for transit damage

C 20703/30 ①

Ensure copy of NDT results attached to work order.

18.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: Inspect for damage & ensure results are as per Dwg D412-664-203

~~N/A~~ 7-3-16

19.0 SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

FC 07/04/02

complete

1-Prime inside and outside crosstube as per QSI 005 4.2

PRIME AREA AROUND
SUPPORTS
ONLY

~~N/A~~ 07/03/15

2-Paint outside crosstube with White Imron as per QSI 005 4.2

07.03.16

07 04 02

20.0 QC14

Inspect Spray Paint



Comment: Inspect Spray Paint

BT 07-04-04

Wrap in plastic bag to protect from scratches

~~N/A~~ 7-3-16

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: Date: 07/04/05
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07/03/27	230	The 2 supports had to be removed with a zip gun.	J QS1042	Bonate the 2 original supports to engineering and replace with 2 new ones.	J 07/03/27	J 07/03/27	J QS1042	J 07/03/27

NOTE: Date & initial all entries

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Drawing Name: X-TUBE 412

Job Number: 31138

Part Number: D412664145

Job Number:



Seq. #: Machine Or Operation:

Description :

27.0 LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

Assemble as per Dwg D412-664-145

Install Chaffing Shield *AVH 07.03.16*

BT 07.04.04

Instal supports with magnobond 6398 per dwg D412-664-245,
cure for 12hrs before packaging.

10:00 am 07-04-04

Time & date of application:

8:00 pm

BT 07.03.16

Batch: *M102437 M103628*

28.0 QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

CP 07.04.04

BT 07.03.16

29.0 PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D412-664-105

*****Ensure tube is not packaged if curing time is less than 12 hrs, see step 26 for application time & date

Time & date of packaging: *11:00 07.03.16*

POSITIVE RECALL

OK

EFFECTIVE 07.03.05 AUTH OP *P 07.04.05*

RELEASED 07.03.16 DATE OP *P*

RELEASED FOR ENG USE ONLY (P 07.03.16)

30.0 QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

A - 07.03.16

Job Completion



W 07.04.05

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART

DESIGN	<i>GP</i>	DRAWN BY	<i>GP</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA
CHECKED	#	APPROVED	#	DRAWING NO. D412-664-145
DATE	07.03.01			REV. B SHEET 1 OF 3
A	06.12.21			TITLE CROSSTUBE ASS'Y (412 LOW-N FWD) NTS
B	07.03.01			SCALE

PRELIMINARY ISSUE

PARTS LIST:

Qty	Part Number	Description
X	D412-664-145	CROSSTUBE ASSEMBLY (412 LOW-NARROW FWD)
1	D6019-128	CROSSTUBE
1	D2856-250-842	ABRASION STRIP
2	D2893-1	SUPPORT
1	D3189-3	CHAFING SHIELD
4	D3595-063-440	RUBBER CUSHION
2	MS21920-22	CLAMP
4	MS21920-24	CLAMP
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

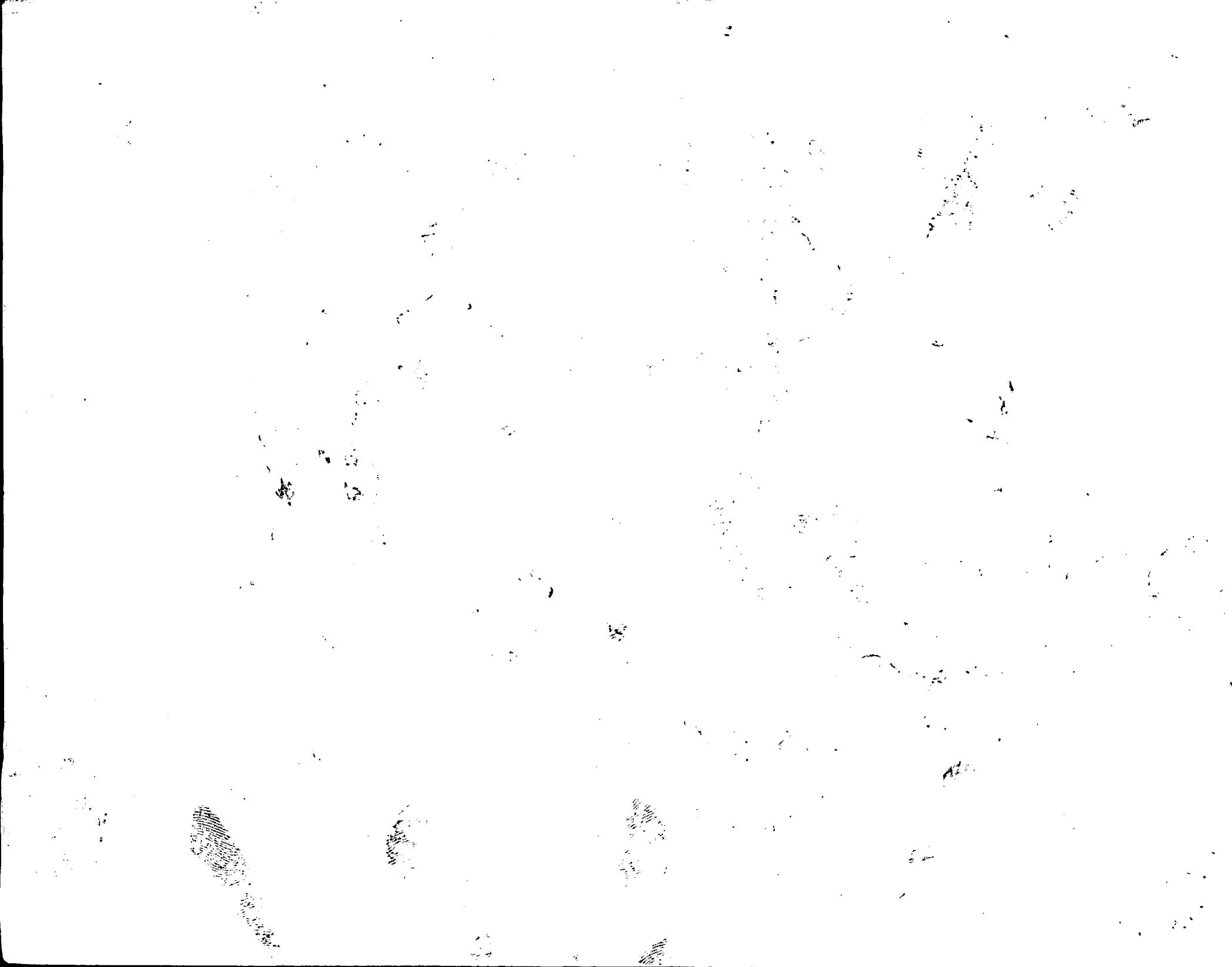
GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6019-128
FINISHED LENGTH = 124.48 ± 0.020 (BEFORE BENDING/TRIMMING)
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR MS21920-22 CLAMPS AND ASSOCIATED HARDWARE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-XXX-YYY ABRASION STRIPS WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-24 CLAMPS WITH D3595-063-440 RUBBER CUSHIONS TO SECURE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB.

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DART AEROSPACE LTD	Work Order:	31138
Description: X-TUBE	Part Number:	D412-664-145
Inspection Dwg: D412-664-145 Rev: B		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

x First Article x Prototype

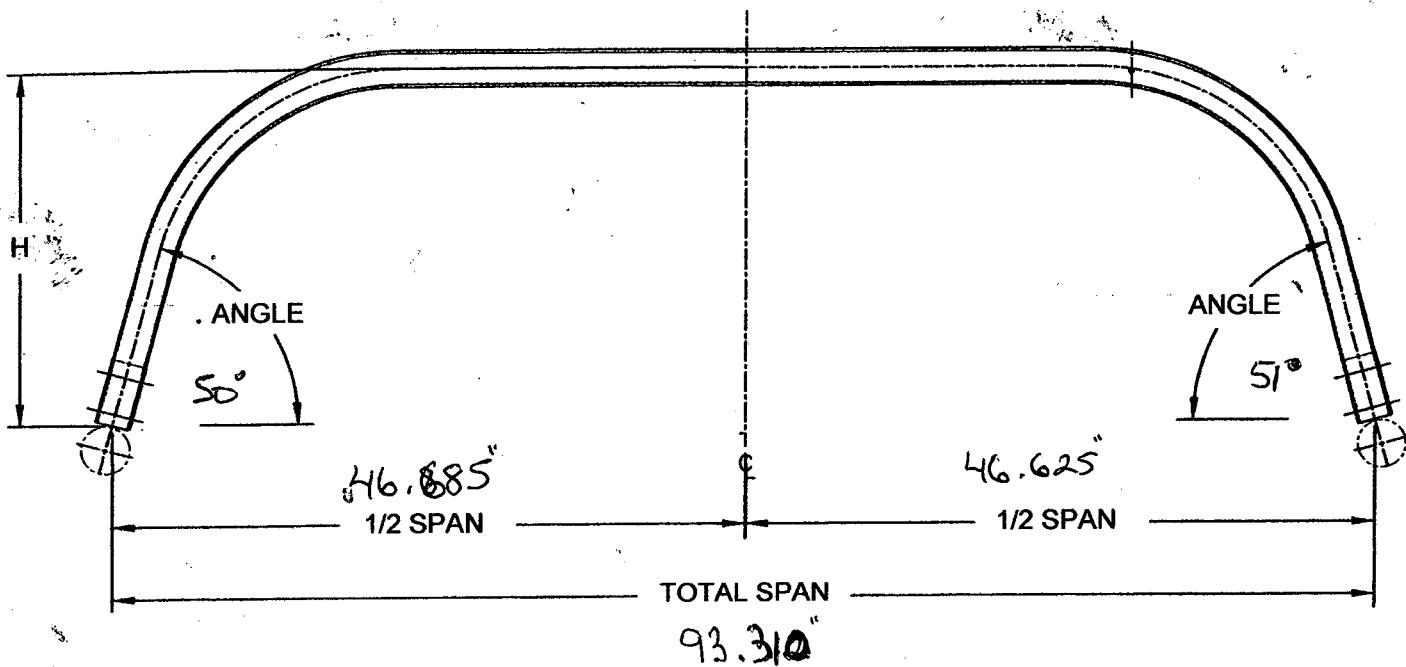
Measured by:	<i>BG</i>
Date:	<i>07-03-12</i>

Audited by:	J. S
Date:	07/03/12

Prototype Approval:	<i>CP</i>
Date:	<i>07.03.16</i>

Rev	Date	Change	Revised by	Approved
A		New issue	KJ/JLM	

Crosstube Bend Dimension Sheet



PART NUMBER: D412-664-145

BATCH NUMBER: B3138

DRAWING: D412-664-145 REVISION: B

H: 19.36"

1/2 SPAN: 46.6

TOTAL SPAN: 93.8

ANGLE: 50°±1°

QC 15: 11

DATE: 07/03/13

QTY: 1

CP 07.03.13





HeathAir

INTERNATIONAL (1991) INC.

681 Ave. Lepine, Dorval, Québec H9P 1G3
Tél.: (514) 636-1000 • Fax: (514) 636-0031

W.O. № 36061

A.M.O. Number: 46/90

NON-DESTRUCTIVE TESTING REPORT

AIRCRAFT / COMPONENT INFORMATION

REGISTRATION:

MODEL/TYPE:

SERIAL NUMBER:

TOTAL HR/LDG:

OPERATED BY:

BASED AT:

INSPECTION REQUIREMENTS

Carry out FPI of seven (7) cross tubes (external surface) as per ASTM E-1417-05 and the Dart QSI 038, Section 4.1.1 (on file at client) - parts delivered to HeathAir.

Qty. (2) P/N D412-664-145 S/N's B31137 & B31138
Qty. (1) P/N D206-667-103 S/N B30428
Qty. (2) P/N D412-664-203 S/N's B30427 & B30425
Qty. (2) P/N D206-667-101 S/N's B30439 & B30437

 RADIOGRAPHY ULTRASONIC PENETRANT MAGNETIC PARTICLE EDDY CURRENT

INSPECTION REPORT

Fluorescent penetrant inspection was performed in accordance with the above requirements on seven (7) cross tubes.

Note: A Level 3 penetrant was substituted for the requested Level 2 (3 is more sensitive)
Ardrox 970P25E Batch #04B503.

Seven (7) cross tubes PASSED inspection.

THE MAINTENANCE DESCRIBED ABOVE HAS BEEN PERFORMED IN ACCORDANCE WITH
THE APPLICABLE STANDARDS OF AIRWORTHINESS

INSPECTED BY: _____

DATE March 29, 2007

INSPECTION STAMP(S) Not Required

CUSTOMER INFORMATION

CUSTOMER: Dart Aerospace

P.O. NUMBER 3440

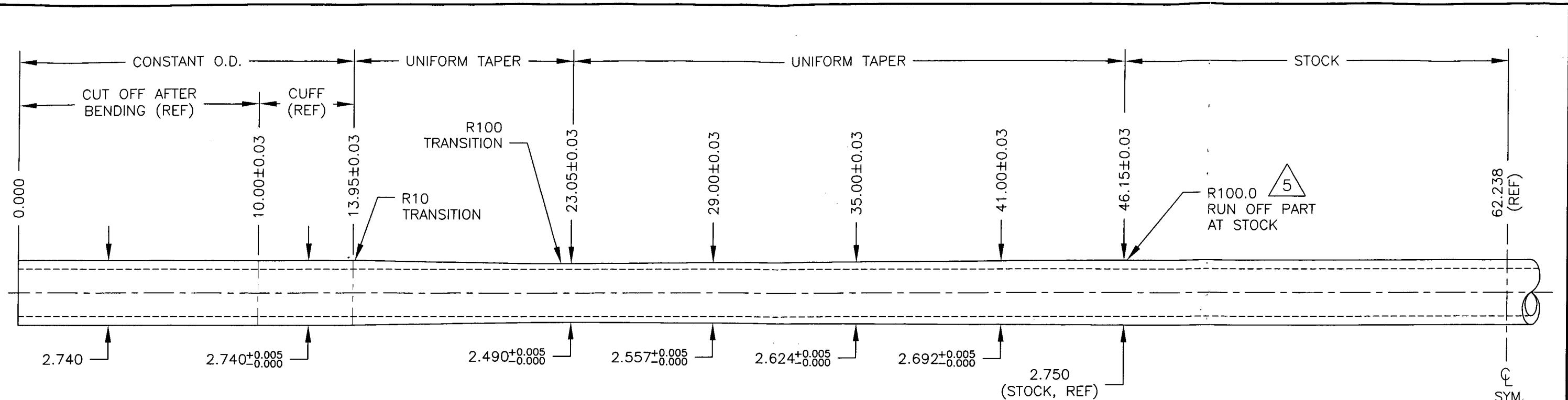
ADDRESS:

CONTACT NAME:

LABOUR	@	\$
MATERIALS	@	
TRAVEL EXPENSES	@	GST
HOTEL EXPENSES	@	PST

INVOICE NO. _____

TOTAL \$ _____



D412-664-145 MACHINING DETAIL

SHOP COPY
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WORK ORDER
NO. 31138

PRELIMINARY ISSUE

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DESIGN	DRAWN BY	DART	DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA
CHECKED	APPROVED		DRAWING NO. D412-664-145
			REV. B SHEET 3 OF 3
DATE		TITLE	SCALE CROSSTUBE (412 LOW-NARROW FWD) 1:4
07.03.01			



